

1992-2005
**LABOUR FORCE PROJECTIONS
AUSTRALIA**



EMBARGOED UNTIL 11.30 A.M. 11 NOVEMBER 1991

NEW ISSUE

LABOUR FORCE PROJECTIONS, AUSTRALIA 1992-2005

IAN CASTLES
Australian Statistician

© Commonwealth of Australia 1991

Note: This publication contains two sets of labour force projections, corresponding to the Series A and D of the current ABS population projections.

CONTENTS

<i>Table</i>	<i>Page</i>
.. Labour Force Projections	1
Labour force by sex, Australia - annual averages, 1978 to 1990 and projections, 1992 to 2005—	
1. Series A and D, by sex	3
Series A	
2. Males, by age	4
3. Females, by age	5
4. Persons, by age	6
Series D	
5. Males, by age	7
6. Females, by age	8
7. Persons, by age	9
Participation rates by sex, Australia - annual averages, 1978 to 1990 and projections, 1992 to 2005—	
8. Series A and D, by sex	10
9. Males, by age	11
10. Females, by age	12
11. Persons, by age, Series A	13
.. Explanatory Notes	14
.. Technical Note	15
.. Glossary	16
.. Appendix - <i>Labour Force Projections, Australia: Methodology</i>	17

INQUIRIES

- for further information about statistics in this publication contact Ian Clout on Canberra (06) 252 6018 or any ABS State office.
- for information about other ABS statistics and services please refer to the last page of this publication.

LABOUR FORCE PROJECTIONS

Introduction

Projections of the civilian labour force in Australia are given in this publication. The projections are based on a study of labour force participation rate trend estimates up to August 1990 together with the Series A and D population projections published in *Projections of the Populations of Australia, States and Territories 1989 to 2031* (3222.0). They illustrate the size and composition of the future Australian civilian labour force which would be achieved if the underlying assumptions were realised. These assumptions are described in the Technical Note (page 15). The projections are thus neither predictions nor forecasts of the labour force.

Total labour force

The civilian labour force aged 15 and over (those in civilian employment plus those who are unemployed) is projected to grow from 8.5 million persons in 1990 to between 10.7 million (Series D) and 10.9 million (Series A) persons in the year 2005.

The publication presents results based on both the 'high' series (Series A) and the 'low' series (Series D) of the population projections; the following discussion is based on the results which flow from the 'high' series.

A labour force numbering 10.9 million in 2005 would be equivalent to an average growth rate of 1.7 per cent per annum during the period 1990 to 2005.

The annual growth rate of the labour force is projected to decline gradually from 2.1 per cent for 1992-1993 to 1.1 per cent for 2004-2005.

Age projections

The projections of participation rates, when applied to the 'high' population projections, show a changing age structure of the labour force.

- The labour force included 1.98 million persons in the 15-24 age group in 1990 and for this group there is a small projected rise to 2.06 million in 2005.
- Persons aged 15-24 would represent a declining proportion of the total labour force, falling from 23.4 per cent in 1990 to 18.9 per cent in 2005.
- The projected growth in the numbers of persons aged 55-64 in the labour force is relatively high. In 1990 this group was estimated to be 641,200, and the projections suggest that by 2005 it will reach 990,200.
- Persons in older age groups are projected to contribute a larger share of the labour force. For the 55-64 age group their representation is projected to grow from 7.6 per cent in 1990 to 9.1 per cent in 2005.
- For both males and females, the major gains in labour force numbers are projected to occur for the 45-54 age group. Between 1990 and 2005, the male labour force in this age group is projected to rise by 402,000, an increase of 33 per cent, and for females the projected gain is 558,000 (51%).

FIGURE 1. LABOUR FORCE ESTIMATES AND PROJECTIONS PERSONS

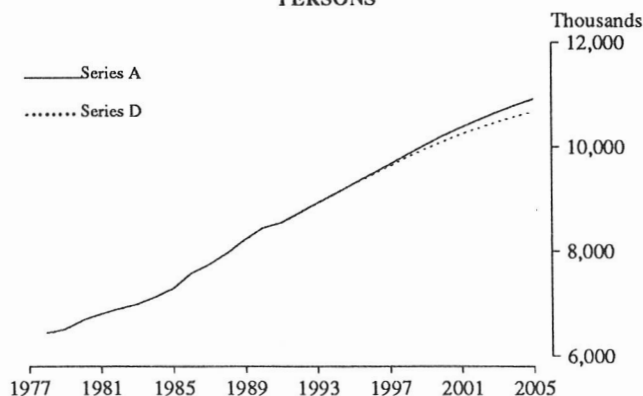
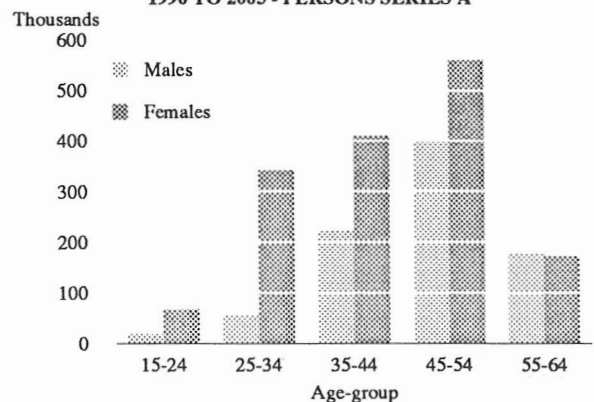


FIGURE 2. PROJECTED GAINS IN THE LABOUR FORCE 1990 TO 2005 - PERSONS SERIES A



Males and females in the labour force

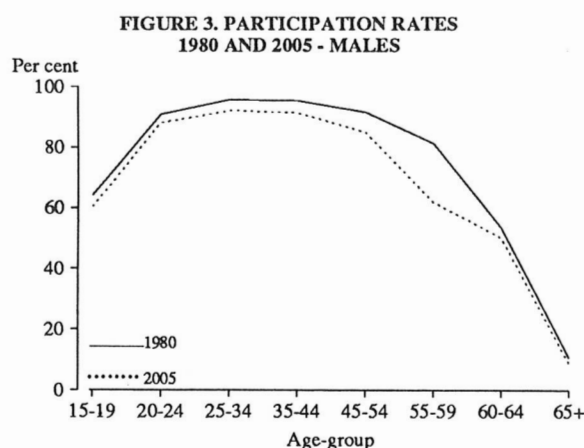
From the labour force projections based on the 'high' population projections:

- The number of males in the labour force is projected to be 5.86 million in 2005 with an average annual growth rate of 1.2 per cent between 1990 and 2005.
- For females, the projected labour force in 2005 is 5.06 million, representing an average annual rate of growth of 2.5 per cent over the previous fifteen years.
- These results would shift the male/female ratio of the labour force from 59 per cent/41 per cent in 1990 to 54 per cent/46 per cent in 2005.

Participation rates

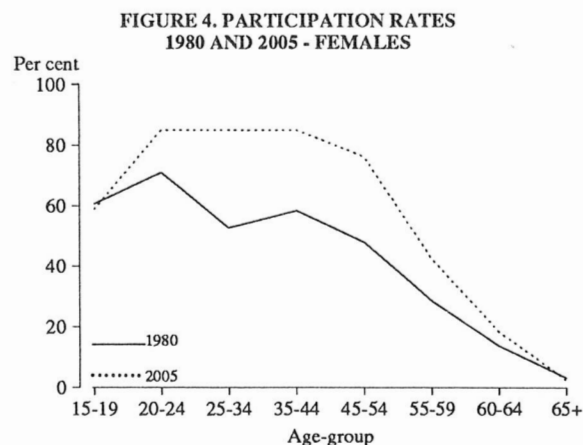
The projections of male participation rates show marked differences by age group, although the rates for all age groups are projected to fall. For those aged 15-19, the participation rate is projected to fall from 61.5 per cent in 1990 to 60.5 per cent in 2005 and for the 45-54 age group it is projected to fall from 90.0 per cent in 1990 to 85.0 per cent in 2005. The most significant projected fall is for the 55-59 age group, from 75.1 per cent in 1990 to 61.8 per cent in 2005.

Figure 3 below shows the projected differences in rates between 1980 and 2005, highlighting the markedly reduced participation by males aged between 45 and 59 years.



For females, the rates are projected to increase for all age groups except those under 20 years and those aged 65 and over. The participation rate for females aged 25-34 years is projected to increase from 65.7 per cent in 1990 to 85.0 per cent in 2005, and that for females aged 35-44 is projected to increase from 72.0 per cent to 85.0 per cent over the same period.

The significantly higher participation by females aged 20 to 59 years is apparent in the comparison of actual rates for 1980 and projected rates for 2005 shown in Figure 4.



The overall projected participation rate for males is influenced by the changing age structure of the population projections as well as the declining participation rates for each age group. The participation rate for the 'high' series (Series A) is projected to decline from 75.6 per cent in 1990 to 71.3 per cent in 2005, reflecting the substantially higher proportion of the male population aged 65 and over, together with a marked fall in the proportion of males aged 25-44 years. This latter group has the highest participation rate, projected to remain at more than 90 per cent.

For females, there are similar changes to the age structure of the 'high' population projections but participation rates for each age group are generally projected to increase. The net effect of these changes is for the overall projected participation rate to increase from 52.2 per cent in 1990 to 60.3 per cent in 2005.

Under the Series A projections, the participation rate for persons would increase from 63.8 per cent in 1990 to 66.0 per cent in 2002 before decreasing to 65.7 per cent in 2005 due to the greater influence of those age groups with relatively lower projected participation rates.

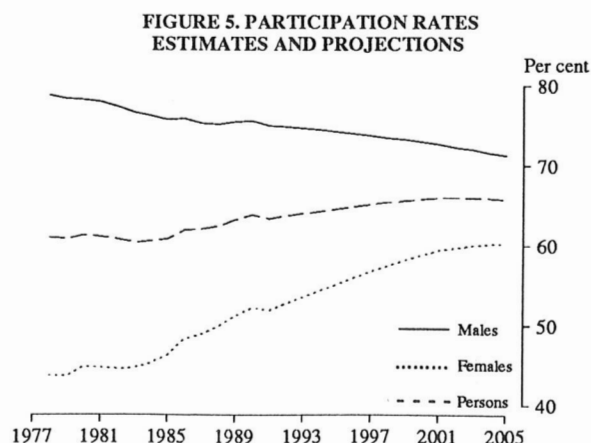


TABLE 1. LABOUR FORCE BY SEX, AUSTRALIA — SERIES A AND D
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(’000)

ANNUAL AVERAGES							
	<i>Year</i>	<i>Males</i>	<i>Females</i>	<i>Persons</i>			
	1978	4,103.9	2,339.5	6,443.4			
	1979	4,146.5	2,372.6	6,519.0			
	1980	4,211.2	2,481.7	6,692.9			
	1981	4,278.9	2,531.5	6,810.3			
	1982	4,332.8	2,577.0	6,909.8			
	1983	4,371.7	2,625.7	6,997.4			
	1984	4,426.9	2,708.1	7,135.1			
	1985	4,482.3	2,818.0	7,300.3			
	1986	4,586.1	3,001.6	7,587.6			
	1987	4,652.0	3,105.6	7,757.6			
	1988	4,744.5	3,230.0	7,974.5			
	1989	4,855.6	3,380.9	8,236.5			
	1990	4,953.2	3,505.9	8,459.1			
PROJECTIONS							
	<i>Series A</i>				<i>Series D</i>		
<i>June</i>	<i>Males</i>	<i>Females</i>	<i>Persons</i>		<i>Males</i>	<i>Females</i>	<i>Persons</i>
1992	5,071.3	3,665.3	8,736.6		5,071.3	3,665.3	8,736.6
1993	5,140.4	3,781.7	8,922.2		5,140.4	3,781.7	8,922.2
1994	5,208.1	3,898.9	9,107.0		5,208.1	3,898.9	9,107.0
1995	5,274.6	4,017.5	9,292.1		5,271.8	4,015.3	9,287.2
1996	5,339.6	4,135.7	9,475.3		5,331.3	4,129.1	9,460.4
1997	5,406.1	4,256.8	9,662.9		5,389.4	4,243.2	9,632.6
1998	5,472.6	4,378.0	9,850.6		5,444.7	4,354.9	9,799.6
1999	5,535.1	4,495.3	10,030.4		5,493.0	4,460.0	9,953.0
2000	5,597.7	4,611.2	10,208.9		5,541.2	4,563.2	10,104.4
2001	5,653.3	4,718.1	10,371.4		5,582.3	4,657.0	10,239.3
2002	5,704.3	4,814.2	10,518.5		5,618.6	4,739.7	10,358.3
2003	5,756.9	4,906.0	10,662.9		5,656.2	4,817.7	10,475.0
2004	5,807.8	4,989.0	10,796.9		5,692.0	4,886.8	10,578.9
2005	5,855.8	5,062.6	10,918.4		5,724.7	4,946.3	10,671.1

TABLE 2. LABOUR FORCE BY AGE — MALES SERIES A
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(’000)

Year	Age Group								Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	65 and over	
ANNUAL AVERAGES									
1978	413.2	539.8	1,095.1	807.7	723.2	287.8	167.5	69.7	4,103.9
1979	422.6	555.6	1,115.6	826.9	712.7	293.6	152.4	66.9	4,146.5
1980	428.6	572.7	1,138.0	851.8	705.2	301.9	146.2	66.8	4,211.2
1981	429.2	589.0	1,163.1	884.7	698.9	300.0	147.9	65.9	4,278.9
1982	421.8	596.1	1,178.1	932.4	698.4	298.1	146.9	60.9	4,332.8
1983	401.8	603.2	1,192.2	976.2	700.4	295.0	143.2	59.7	4,371.7
1984	398.6	600.3	1,196.1	1,014.6	709.7	298.5	147.7	61.4	4,426.9
1985	402.3	601.8	1,203.6	1,051.1	713.6	296.7	151.0	62.2	4,482.3
1986	420.9	600.1	1,229.2	1,088.8	729.6	295.9	159.6	62.0	4,586.1
1987	423.9	593.5	1,254.8	1,121.9	741.3	288.0	163.1	65.5	4,652.0
1988	427.8	596.4	1,278.7	1,160.6	758.2	278.3	174.4	70.1	4,744.5
1989	443.4	600.1	1,303.9	1,182.6	793.4	279.2	180.9	72.1	4,855.6
1990	436.6	611.6	1,317.5	1,219.2	833.0	275.5	185.3	74.5	4,953.2
PROJECTIONS									
1992	410.9	649.3	1,331.6	1,245.5	901.8	272.9	181.3	77.9	5,071.3
1993	403.0	658.9	1,337.9	1,261.7	942.9	276.4	179.3	80.3	5,140.4
1994	398.1	659.0	1,345.5	1,284.5	979.8	280.9	177.8	82.5	5,208.1
1995	396.7	653.2	1,354.3	1,305.0	1,016.3	288.8	175.7	84.7	5,274.6
1996	398.7	636.6	1,367.0	1,328.3	1,050.6	294.1	177.4	86.9	5,339.6
1997	403.8	619.0	1,378.3	1,353.7	1,081.0	299.9	181.8	88.5	5,406.1
1998	410.1	607.3	1,385.2	1,374.7	1,112.1	306.7	186.3	90.1	5,472.6
1999	415.9	599.8	1,388.9	1,394.5	1,134.4	318.3	191.6	91.7	5,535.1
2000	421.6	597.3	1,392.5	1,409.6	1,157.1	327.4	199.2	93.0	5,597.7
2001	424.8	599.9	1,395.0	1,414.3	1,179.8	339.4	205.3	94.8	5,653.3
2002	427.3	606.7	1,394.7	1,419.9	1,184.2	363.0	211.8	96.7	5,704.3
2003	428.9	615.4	1,391.8	1,425.7	1,197.8	379.6	219.1	98.6	5,756.9
2004	432.2	623.3	1,383.6	1,432.7	1,217.4	388.0	230.1	100.5	5,807.8
2005	434.5	630.9	1,374.6	1,440.9	1,234.8	398.0	239.5	102.6	5,855.8

TABLE 3. LABOUR FORCE BY AGE — FEMALES SERIES A
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
('000)

Year	Age Group								Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	65 and over	
ANNUAL AVERAGES									
1978	375.0	409.5	576.7	457.5	352.6	106.3	40.0	21.9	2,339.5
1979	375.2	422.7	588.8	475.8	350.8	101.2	38.8	19.1	2,372.6
1980	392.5	443.3	619.8	502.0	352.5	107.1	41.3	23.1	2,481.7
1981	384.6	451.9	643.4	522.3	361.0	109.6	37.2	21.4	2,531.5
1982	376.5	464.0	656.0	556.3	363.3	104.1	36.5	20.5	2,577.0
1983	374.2	475.9	671.2	579.5	357.4	107.1	40.9	19.6	2,625.7
1984	371.7	483.1	691.7	611.1	379.2	109.1	41.9	20.4	2,708.1
1985	377.6	489.4	735.1	661.5	385.5	105.5	43.2	20.2	2,818.0
1986	398.9	493.2	787.4	723.3	417.8	111.5	46.4	23.1	3,001.6
1987	401.3	495.8	823.0	760.8	435.5	115.1	48.2	25.9	3,105.6
1988	402.3	496.9	852.8	819.3	464.9	115.5	51.1	27.2	3,230.0
1989	412.7	510.3	890.6	867.4	503.8	117.9	54.6	23.6	3,380.9
1990	404.7	522.5	913.0	920.8	538.0	121.3	59.2	26.5	3,505.9
PROJECTIONS									
1992	383.3	566.7	959.4	955.7	593.9	125.1	53.3	27.9	3,665.3
1993	376.0	580.8	986.5	990.3	635.4	130.3	53.8	28.5	3,781.7
1994	371.4	585.2	1,017.1	1,028.9	676.2	136.4	54.6	29.1	3,898.9
1995	369.5	584.5	1,048.5	1,067.1	719.3	143.9	55.0	29.7	4,017.5
1996	371.6	572.5	1,084.7	1,107.0	762.9	150.2	56.5	30.3	4,135.7
1997	376.2	559.8	1,120.5	1,148.4	805.0	157.4	58.9	30.7	4,256.8
1998	381.5	552.7	1,151.5	1,185.6	848.8	165.5	61.3	31.2	4,378.0
1999	387.4	549.1	1,179.5	1,219.9	886.8	177.0	64.0	31.6	4,495.3
2000	393.6	548.8	1,205.6	1,249.5	926.8	187.6	67.4	32.0	4,611.2
2001	396.4	553.7	1,227.9	1,271.0	966.4	199.9	70.2	32.5	4,718.1
2002	398.6	561.9	1,245.7	1,289.5	991.8	220.3	73.4	33.0	4,814.2
2003	400.7	570.7	1,257.6	1,304.7	1,024.4	237.4	77.1	33.5	4,906.0
2004	403.2	580.0	1,259.0	1,319.4	1,060.6	250.4	82.3	34.1	4,989.0
2005	404.8	589.4	1,254.3	1,330.4	1,096.3	265.6	87.1	34.6	5,062.6

TABLE 4. LABOUR FORCE BY AGE — PERSONS SERIES A
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(^{'000})

Year	Age Group								Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	65 and over	
ANNUAL AVERAGES									
1978	788.3	949.3	1,671.8	1,265.2	1,075.8	394.1	207.4	91.6	6,443.4
1979	797.9	978.3	1,704.4	1,302.7	1,063.5	394.9	191.2	86.1	6,519.0
1980	821.2	1,015.9	1,757.9	1,353.8	1,057.8	408.9	187.5	89.9	6,692.9
1981	813.8	1,040.9	1,806.5	1,407.0	1,060.0	409.7	185.1	87.3	6,810.3
1982	798.3	1,060.1	1,834.1	1,488.7	1,061.7	402.1	183.4	81.5	6,909.8
1983	776.0	1,079.0	1,863.4	1,555.7	1,057.8	402.1	184.1	79.3	6,997.4
1984	770.3	1,083.5	1,887.8	1,625.7	1,088.9	407.6	189.6	81.7	7,135.1
1985	779.9	1,091.2	1,938.7	1,712.6	1,099.1	402.2	194.2	82.4	7,300.3
1986	819.8	1,093.3	2,016.6	1,812.1	1,147.4	407.4	206.0	85.0	7,587.6
1987	825.2	1,089.2	2,077.7	1,882.7	1,176.8	403.1	211.3	91.5	7,757.6
1988	830.1	1,093.4	2,131.5	1,979.9	1,223.1	393.8	225.5	97.3	7,974.5
1989	856.0	1,110.4	2,194.5	2,050.0	1,297.2	397.1	235.5	95.7	8,236.5
1990	841.3	1,134.1	2,230.5	2,140.0	1,371.0	396.7	244.5	101.0	8,459.1
PROJECTIONS									
1992	794.3	1,216.0	2,291.0	2,201.2	1,495.7	398.0	234.6	105.8	8,736.6
1993	779.0	1,239.7	2,324.4	2,251.9	1,578.3	406.7	233.2	108.8	8,922.2
1994	769.5	1,244.2	2,362.6	2,313.4	1,656.0	417.3	232.4	111.7	9,107.0
1995	766.2	1,237.7	2,402.8	2,372.1	1,735.6	432.6	230.6	114.4	9,292.1
1996	770.3	1,209.1	2,451.7	2,435.3	1,813.4	444.4	233.9	117.2	9,475.3
1997	780.0	1,178.8	2,498.7	2,502.1	1,885.9	457.3	240.7	119.3	9,662.9
1998	791.6	1,160.0	2,536.7	2,560.3	1,960.8	472.2	247.6	121.3	9,850.6
1999	803.3	1,148.9	2,568.4	2,614.4	2,021.2	495.3	255.5	123.3	10,030.4
2000	815.2	1,146.1	2,598.1	2,659.0	2,083.9	515.1	266.5	124.9	10,208.9
2001	821.2	1,153.6	2,623.0	2,685.3	2,146.2	539.3	275.5	127.4	10,371.4
2002	825.9	1,168.6	2,640.4	2,709.4	2,176.0	583.3	285.2	129.8	10,518.5
2003	829.6	1,186.0	2,649.5	2,730.4	2,222.2	617.0	296.2	132.1	10,662.9
2004	835.5	1,203.3	2,642.6	2,752.1	2,278.0	638.4	312.4	134.5	10,796.9
2005	839.3	1,220.3	2,628.9	2,771.3	2,331.2	663.6	326.6	137.2	10,918.4

TABLE 5. LABOUR FORCE BY AGE — MALES SERIES D
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(⁰⁰⁰⁰)

Year	Age Group								Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	65 and over	
ANNUAL AVERAGES									
1978	413.2	539.8	1,095.1	807.7	723.2	287.8	167.5	69.7	4,103.9
1979	422.6	555.6	1,115.6	826.9	712.7	293.6	152.4	66.9	4,146.5
1980	428.6	572.7	1,138.0	851.8	705.2	301.9	146.2	66.8	4,211.2
1981	429.2	589.0	1,163.1	884.7	698.9	300.0	147.9	65.9	4,278.9
1982	421.8	596.1	1,178.1	932.4	698.4	298.1	146.9	60.9	4,332.8
1983	401.8	603.2	1,192.2	976.2	700.4	295.0	143.2	59.7	4,371.7
1984	398.6	600.3	1,196.1	1,014.6	709.7	298.5	147.7	61.4	4,426.9
1985	402.3	601.8	1,203.6	1,051.1	713.6	296.7	151.0	62.2	4,482.3
1986	420.9	600.1	1,229.2	1,088.8	729.6	295.9	159.6	62.0	4,586.1
1987	423.9	593.5	1,254.8	1,121.9	741.3	288.0	163.1	65.5	4,652.0
1988	427.8	596.4	1,278.7	1,160.6	758.2	278.3	174.4	70.1	4,744.5
1989	443.4	600.1	1,303.9	1,182.6	793.4	279.2	180.9	72.1	4,855.6
1990	436.6	611.6	1,317.5	1,219.2	833.0	275.5	185.3	74.5	4,953.2
PROJECTIONS									
1992	410.9	649.3	1,331.6	1,245.5	901.8	272.9	181.3	77.9	5,071.3
1993	403.0	658.9	1,337.9	1,261.7	942.9	276.4	179.3	80.3	5,140.4
1994	398.1	659.0	1,345.5	1,284.5	979.8	280.9	177.8	82.5	5,208.1
1995	396.4	652.9	1,353.2	1,304.3	1,016.1	288.7	175.6	84.7	5,271.8
1996	398.0	635.5	1,363.8	1,326.1	1,049.8	294.0	177.3	86.8	5,331.3
1997	402.4	616.8	1,372.0	1,349.2	1,079.4	299.6	181.6	88.5	5,389.4
1998	407.8	603.5	1,374.9	1,367.0	1,109.3	306.1	185.9	90.0	5,444.7
1999	412.4	594.2	1,373.7	1,382.8	1,130.1	317.5	191.0	91.4	5,493.0
2000	417.0	589.8	1,372.5	1,393.5	1,151.1	326.3	198.4	92.7	5,541.2
2001	419.0	590.6	1,370.3	1,393.8	1,171.9	337.9	204.3	94.5	5,582.3
2002	420.3	595.7	1,365.6	1,394.7	1,174.2	361.2	210.6	96.3	5,618.6
2003	420.7	602.6	1,358.5	1,395.6	1,185.5	377.5	217.7	98.0	5,656.2
2004	422.8	608.9	1,346.2	1,397.7	1,202.6	385.5	228.5	99.8	5,692.0
2005	423.8	614.9	1,333.2	1,400.9	1,217.3	395.1	237.7	101.9	5,724.7

TABLE 6. LABOUR FORCE BY AGE — FEMALES SERIES D
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(^{'000})

Year	Age Group								Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	65 and over	
ANNUAL AVERAGES									
1978	375.0	409.5	576.7	457.5	352.6	106.3	40.0	21.9	2,339.5
1979	375.2	422.7	588.8	475.8	350.8	101.2	38.8	19.1	2,372.6
1980	392.5	443.3	619.8	502.0	352.5	107.1	41.3	23.1	2,481.7
1981	384.6	451.9	643.4	522.3	361.0	109.6	37.2	21.4	2,531.5
1982	376.5	464.0	656.0	556.3	363.3	104.1	36.5	20.5	2,577.0
1983	374.2	475.9	671.2	579.5	357.4	107.1	40.9	19.6	2,625.7
1984	371.7	483.1	691.7	611.1	379.2	109.1	41.9	20.4	2,708.1
1985	377.6	489.4	735.1	661.5	385.5	105.5	43.2	20.2	2,818.0
1986	398.9	493.2	787.4	723.3	417.8	111.5	46.4	23.1	3,001.6
1987	401.3	495.8	823.0	760.8	435.5	115.1	48.2	25.9	3,105.6
1988	402.3	496.9	852.8	819.3	464.9	115.5	51.1	27.2	3,230.0
1989	412.7	510.3	890.6	867.4	503.8	117.9	54.6	23.6	3,380.9
1990	404.7	522.5	913.0	920.8	538.0	121.3	59.2	26.5	3,505.9
PROJECTIONS									
1992	383.3	566.7	959.4	955.7	593.9	125.1	53.3	27.9	3,665.3
1993	376.0	580.8	986.5	990.3	635.4	130.3	53.8	28.5	3,781.7
1994	371.4	585.2	1,017.1	1,028.9	676.2	136.4	54.6	29.1	3,898.9
1995	369.3	584.2	1,047.6	1,066.6	719.1	143.8	55.0	29.7	4,015.3
1996	370.9	571.4	1,082.1	1,105.4	762.4	150.1	56.4	30.3	4,129.1
1997	374.9	557.6	1,115.0	1,145.1	804.0	157.1	58.8	30.7	4,243.2
1998	379.3	549.1	1,142.4	1,179.8	847.1	165.1	61.1	31.2	4,354.9
1999	384.2	543.6	1,165.6	1,210.8	884.1	176.4	63.7	31.6	4,460.0
2000	389.4	541.4	1,186.8	1,236.8	923.0	186.8	67.0	31.9	4,563.2
2001	391.2	544.6	1,204.4	1,254.5	961.3	198.9	69.8	32.4	4,657.0
2002	392.4	551.2	1,217.4	1,268.7	985.2	219.1	72.9	32.9	4,739.7
2003	393.4	558.3	1,224.8	1,279.5	1,016.1	235.9	76.4	33.4	4,817.7
2004	394.9	566.2	1,221.8	1,289.5	1,050.4	248.7	81.5	33.9	4,886.8
2005	395.3	574.1	1,213.0	1,295.7	1,083.9	263.7	86.2	34.4	4,946.3

TABLE 7. LABOUR FORCE BY AGE — PERSONS SERIES D
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(‘000)

Year	Age Group							65 and over	Total
	15-19	20-24	25-34	35-44	45-54	55-59	60-64		
ANNUAL AVERAGES									
1978	788.3	949.3	1,671.8	1,265.2	1,075.8	394.1	207.4	91.6	6,443.4
1979	797.9	978.3	1,704.4	1,302.7	1,063.5	394.9	191.2	86.1	6,519.0
1980	821.2	1,015.9	1,757.9	1,353.8	1,057.8	408.9	187.5	89.9	6,692.9
1981	813.8	1,040.9	1,806.5	1,407.0	1,060.0	409.7	185.1	87.3	6,810.3
1982	798.3	1,060.1	1,834.1	1,488.7	1,061.7	402.1	183.4	81.5	6,909.8
1983	776.0	1,079.0	1,863.4	1,555.7	1,057.8	402.1	184.1	79.3	6,997.4
1984	770.3	1,083.5	1,887.8	1,625.7	1,088.9	407.6	189.6	81.7	7,135.1
1985	779.9	1,091.2	1,938.7	1,712.6	1,099.1	402.2	194.2	82.4	7,300.3
1986	819.8	1,093.3	2,016.6	1,812.1	1,147.4	407.4	206.0	85.0	7,587.6
1987	825.2	1,089.2	2,077.7	1,882.7	1,176.8	403.1	211.3	91.5	7,757.6
1988	830.1	1,093.4	2,131.5	1,979.9	1,223.1	393.8	225.5	97.3	7,974.5
1989	856.0	1,110.4	2,194.5	2,050.0	1,297.2	397.1	235.5	95.7	8,236.5
1990	841.3	1,134.1	2,230.5	2,140.0	1,371.0	396.7	244.5	101.0	8,459.1
PROJECTIONS									
1992	794.3	1,216.0	2,291.0	2,201.2	1,495.7	398.0	234.6	105.8	8,736.6
1993	779.0	1,239.7	2,324.4	2,251.9	1,578.3	406.7	233.2	108.8	8,922.2
1994	769.5	1,244.2	2,362.6	2,313.4	1,656.0	417.3	232.4	111.7	9,107.0
1995	765.7	1,237.0	2,400.9	2,370.9	1,735.2	432.5	230.6	114.4	9,287.2
1996	768.9	1,206.9	2,445.9	2,431.5	1,812.2	444.1	233.7	117.1	9,460.4
1997	777.3	1,174.4	2,487.1	2,494.3	1,883.4	456.7	240.4	119.2	9,632.6
1998	787.1	1,152.6	2,517.3	2,546.8	1,956.4	471.2	247.0	121.2	9,799.6
1999	796.6	1,137.7	2,539.2	2,593.6	2,014.2	493.9	254.7	123.0	9,953.0
2000	806.3	1,131.3	2,559.3	2,630.4	2,074.1	513.1	265.4	124.6	10,104.4
2001	810.2	1,135.2	2,574.7	2,648.2	2,133.2	536.8	274.0	126.9	10,239.3
2002	812.7	1,146.8	2,583.0	2,663.4	2,159.4	580.3	283.4	129.2	10,358.3
2003	814.1	1,161.0	2,583.2	2,675.1	2,201.6	613.4	294.1	131.4	10,475.0
2004	817.7	1,175.1	2,567.9	2,687.2	2,253.0	634.2	310.0	133.7	10,578.9
2005	819.1	1,189.1	2,546.2	2,696.6	2,301.2	658.8	323.9	136.3	10,671.1

TABLE 8. PARTICIPATION RATES BY SEX, AUSTRALIA — SERIES A AND D
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(Per cent)

ANNUAL AVERAGES						
	<i>Year</i>	<i>Males</i>	<i>Females</i>	<i>Persons</i>		
	1978	78.8	43.7	61.0		
	1979	78.4	43.6	60.8		
	1980	78.3	44.8	61.3		
	1981	78.0	44.7	61.1		
	1982	77.4	44.6	60.8		
	1983	76.7	44.7	60.4		
	1984	76.3	45.3	60.6		
	1985	75.8	46.3	60.8		
	1986	75.9	48.3	61.9		
	1987	75.3	48.9	62.0		
	1988	75.2	49.9	62.4		
	1989	75.5	51.2	63.2		
	1990	75.6	52.2	63.8		
PROJECTIONS						
	<i>Series A</i>			<i>Series D</i>		
<i>June</i>	<i>Males</i>	<i>Females</i>	<i>Persons</i>	<i>Males</i>	<i>Females</i>	<i>Persons</i>
1992	74.9	52.8	63.7	74.9	52.8	63.7
1993	74.7	53.6	64.0	74.7	53.6	64.0
1994	74.5	54.4	64.3	74.5	54.4	64.3
1995	74.3	55.2	64.6	74.3	55.2	64.6
1996	74.0	56.0	64.9	74.0	56.0	64.9
1997	73.8	56.8	65.2	73.8	56.7	65.2
1998	73.5	57.5	65.4	73.5	57.5	65.4
1999	73.3	58.2	65.6	73.2	58.1	65.6
2000	73.0	58.8	65.8	72.9	58.7	65.7
2001	72.7	59.4	66.0	72.6	59.2	65.8
2002	72.3	59.7	66.0	72.2	59.6	65.8
2003	72.0	60.0	65.9	71.8	59.9	65.8
2004	71.6	60.2	65.9	71.5	60.0	65.7
2005	71.3	60.3	65.7	71.1	60.1	65.5

TABLE 9. PARTICIPATION RATES BY AGE — MALES
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(Per cent)

Year	Age Group							65 and over
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	
ANNUAL AVERAGES								
1978	62.9	90.5	96.2	96.1	92.0	83.2	59.3	12.5
1979	64.1	90.9	96.2	95.9	91.6	82.1	54.4	11.6
1980	65.3	91.5	95.9	95.6	91.5	82.6	51.5	11.2
1981	66.0	91.6	95.5	95.5	90.9	81.2	50.5	10.7
1982	65.0	90.9	95.6	95.1	90.7	80.1	48.1	9.7
1983	61.9	91.0	95.5	95.0	90.7	78.5	44.9	9.3
1984	61.2	90.1	95.3	94.9	90.6	78.0	44.1	9.3
1985	60.8	90.3	94.6	94.7	89.9	77.1	43.8	9.1
1986	61.7	90.6	94.9	94.6	90.1	77.0	45.4	8.7
1987	60.4	90.2	94.9	94.3	89.2	75.8	45.9	8.9
1988	60.0	90.6	94.6	94.4	88.6	74.3	48.5	9.2
1989	62.0	90.0	94.6	93.8	89.2	75.3	49.9	9.1
1990	61.5	89.9	94.4	94.4	90.0	75.1	50.7	9.2
PROJECTIONS								
1992	60.9	89.7	94.1	93.6	88.3	72.1	50.0	9.0
1993	60.8	89.6	93.9	93.4	88.1	71.3	50.0	9.0
1994	60.8	89.5	93.8	93.3	87.8	70.5	50.0	9.0
1995	60.8	89.4	93.6	93.1	87.6	69.7	50.0	9.0
1996	60.7	89.3	93.5	92.9	87.3	68.9	50.0	9.0
1997	60.7	89.2	93.3	92.8	87.1	68.1	50.0	9.0
1998	60.7	89.1	93.2	92.6	86.8	67.3	50.0	9.0
1999	60.7	89.0	93.0	92.4	86.6	66.5	50.0	9.0
2000	60.6	88.9	92.9	92.3	86.3	65.7	50.0	9.0
2001	60.6	88.8	92.7	92.1	86.1	64.9	50.0	9.0
2002	60.6	88.6	92.6	91.9	85.8	64.1	50.0	9.0
2003	60.5	88.5	92.4	91.8	85.6	63.3	50.0	9.0
2004	60.5	88.4	92.3	91.6	85.3	62.5	50.0	9.0
2005	60.5	88.3	92.1	91.4	85.0	61.8	50.0	9.0

TABLE 10. PARTICIPATION RATES BY AGE — FEMALES
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(Per cent)

Year	Age Group							65 and over
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	
ANNUAL AVERAGES								
1978	58.9	68.6	51.1	56.6	46.9	30.1	13.1	2.8
1979	58.6	69.3	51.0	57.2	47.1	27.8	12.8	2.4
1980	61.5	71.0	52.4	58.2	47.7	28.9	13.4	2.8
1981	60.5	70.5	53.1	58.2	49.0	29.5	11.6	2.5
1982	59.6	70.9	53.4	58.5	49.3	28.0	11.0	2.4
1983	59.5	71.9	53.9	58.1	48.3	28.7	11.9	2.2
1984	59.0	73.0	55.0	59.1	50.7	29.1	11.7	2.2
1985	59.1	74.2	57.5	61.4	50.9	28.2	11.9	2.1
1986	60.6	75.4	60.6	64.6	54.2	30.1	12.6	2.4
1987	59.3	76.4	62.0	65.4	55.1	31.4	13.1	2.6
1988	58.5	76.7	63.0	67.9	57.0	31.9	13.8	2.6
1989	59.9	77.9	64.7	69.8	59.4	32.7	14.8	2.2
1990	59.4	78.5	65.7	72.0	61.0	34.0	16.1	2.4
PROJECTIONS								
1992	59.4	80.1	67.9	72.1	61.2	33.9	14.7	2.4
1993	59.4	80.8	69.5	73.4	62.4	34.6	15.0	2.4
1994	59.3	81.5	71.1	74.8	63.5	35.2	15.3	2.4
1995	59.3	82.1	72.7	76.2	64.7	35.9	15.6	2.4
1996	59.3	82.6	74.4	77.5	65.8	36.5	15.8	2.4
1997	59.2	83.1	76.2	78.8	67.0	37.2	16.1	2.4
1998	59.2	83.6	77.8	80.1	68.2	37.8	16.4	2.4
1999	59.2	83.9	79.5	81.3	69.3	38.5	16.7	2.4
2000	59.1	84.3	81.0	82.3	70.5	39.1	17.0	2.4
2001	59.1	84.5	82.3	83.2	71.7	39.7	17.2	2.4
2002	59.1	84.7	83.4	84.0	72.8	40.4	17.5	2.4
2003	59.1	84.9	84.3	84.5	74.0	41.0	17.8	2.4
2004	59.0	85.0	84.8	84.9	75.1	41.7	18.1	2.4
2005	59.0	85.0	85.0	85.0	76.3	42.3	18.4	2.4

TABLE 11. PARTICIPATION RATES BY AGE — PERSONS SERIES A
ANNUAL AVERAGES 1978 TO 1990 AND PROJECTIONS 1992 TO 2005
(Per cent)

Year	Age Group							65 and over
	15-19	20-24	25-34	35-44	45-54	55-59	60-64	
ANNUAL AVERAGES								
1978	60.9	79.5	73.7	76.7	70.0	56.4	35.3	6.9
1979	61.4	80.1	73.6	76.9	69.8	54.7	32.7	6.3
1980	63.4	81.2	74.2	77.2	70.1	55.6	31.6	6.4
1981	63.3	81.1	74.4	77.1	70.4	55.3	30.1	6.0
1982	62.4	80.9	74.5	77.0	70.4	54.1	28.8	5.4
1983	60.7	81.5	74.7	76.8	69.9	53.7	27.8	5.2
1984	60.1	81.5	75.1	77.3	71.1	53.9	27.4	5.2
1985	59.9	82.3	76.0	78.3	70.8	53.0	27.4	5.1
1986	61.1	83.1	77.7	79.8	72.6	54.0	28.7	5.1
1987	59.9	83.3	78.4	80.0	72.6	54.0	29.2	5.2
1988	59.2	83.7	78.8	81.3	73.2	53.4	31.0	5.4
1989	61.0	84.0	79.7	81.9	74.6	54.3	32.2	5.2
1990	60.5	84.3	80.1	83.3	75.8	54.8	33.3	5.3
PROJECTIONS								
1992	60.1	85.0	81.0	82.8	75.1	53.3	32.4	5.2
1993	60.1	85.3	81.7	83.4	75.5	53.2	32.5	5.2
1994	60.1	85.5	82.4	84.0	76.0	53.1	32.6	5.3
1995	60.1	85.8	83.2	84.6	76.4	53.1	32.7	5.3
1996	60.0	86.0	84.0	85.2	76.8	53.0	32.9	5.3
1997	60.0	86.2	84.8	85.8	77.2	52.9	33.0	5.3
1998	60.0	86.4	85.5	86.3	77.6	52.9	33.2	5.3
1999	59.9	86.5	86.3	86.8	78.1	52.8	33.3	5.3
2000	59.9	86.6	86.9	87.3	78.5	52.7	33.5	5.3
2001	59.9	86.7	87.5	87.7	78.9	52.6	33.7	5.3
2002	59.8	86.7	88.0	88.0	79.4	52.5	33.9	5.3
2003	59.8	86.7	88.4	88.1	79.8	52.4	34.0	5.3
2004	59.8	86.7	88.6	88.2	80.2	52.3	34.1	5.3
2005	59.7	86.7	88.6	88.2	80.7	52.2	34.3	5.3

EXPLANATORY NOTES

Introduction

This publication contains estimates of the civilian labour force and participation rates for Australia, derived from the Labour Force Survey for the period 1978–1990, and projections of the labour force and participation rates for Australia for the period 1992–2005.

Objectives

2. Labour force projections included in this publication are not intended to be predictions or forecasts. They are illustrations of growth and change in the age-sex structure of the labour force if certain stated demographic, social and economic assumptions apply over the projection period.

3. While the assumptions for the projections are formulated on the basis of an objective assessment of past demographic, social and economic trends, both in Australia and overseas, and their likely future dynamics, there is no certainty that any of the assumptions will be realised.

4. This publication contains two series of labour force projections, corresponding to the Series A and D of the current ABS population projections (see Technical Note, paragraph 6). Users may choose to select a particular series according to their assessments of the corresponding population projections - that is whether they are considered to be high or low.

Methodology

5. The methodology used to develop the projections included in this publication is outlined in the Technical Note and the Appendix.

Annual averages

6. Estimates of the labour force for the period up to 1990 are presented as annual (calendar year) averages of original estimates. Corresponding participation rates were compiled by dividing the annual average labour force estimate by the annual (calendar year) average of the civilian population.

Participation rates for persons

7. Projected participation rates for *persons* included in Table 11 were calculated by adding the *male* and *female* projected labour force for each age group and dividing this by the projected total civilian population for the same

age group. While Table 11 shows participation rates for persons according to the Series A population projections only, rates derived under the Series D population projections would be the same except for minor differences (of the order of 0.1 percentage points) in the rates for *persons* in the 45-54 and 60-64 years age groups.

State projections

8. The practicability of developing labour force projections for the States and Territories will be considered as a future project. Preliminary work to date in applying national projections to State population levels has not yielded satisfactory results. Potential users of State projections are invited to register an expression of interest by contacting The Assistant Director, Labour Force Estimates Subsection, Australian Bureau of Statistics, PO Box 10, Belconnen, ACT 2616 (phone (06) 252 6565).

Floppy disk service

9. The data contained in this publication can also be obtained on floppy disk. Inquiries should be made to Ian Clout on (06) 252 6018 or any ABS State office.

Related publications

10. Other ABS publications which may be of interest include:

The Labour Force, Australia (6203.0) — issued monthly
Projections of the Populations of Australia, States and Territories 1989 to 2031 (3222.0)

Information Paper: A Guide to Smoothing Time Series — Estimates of 'Trend' (1316.0)

Information Paper: Time Series Decomposition — An Overview (1317.0)

Information Paper: Measuring Employment and Unemployment (6279.0)

11. Current publications produced by the ABS are listed in the *Catalogue of Publications and Products, Australia*, (1101.0). The ABS also issues, on Tuesdays and Fridays, a *Publications Advice* (1105.0) which lists publications to be released in the next few days. The Catalogue and Publications Advice are available from any ABS office.

12. Estimates have been rounded and discrepancies may occur between sums of the component items and totals.

TECHNICAL NOTE

Introduction

The size of the labour force is determined by two major factors - i) the size and age-sex structure of the population and ii) labour force participation rates. Both these factors have been considered in the development of the projections included in this publication.

Methodology

2. The first stage in the method used for the preliminary projections was to project participation rates by applying simple regressions over time. Monthly smoothed seasonally adjusted estimates of labour force participation rates from February 1978 to August 1990 were chosen for the extrapolation (rather than original or seasonally adjusted participation rate series) as they provide a better indication of the underlying behaviour when series have a noticeable seasonal pattern and/or are highly irregular.

3. Ordinary least squares regression was applied to derive a linear trend line for the participation rates for each age-sex group (graphs of the results are included in the Appendix). Each group was then assessed individually for consistency with a number of pre-determined criteria. These criteria included the assumptions that:

- for the span of the projection period, Australia would be experiencing economic growth which on average would be similar to that experienced in the past 10 years
- the participation rate for females would not exceed that for males for any age group and
- the female participation rate for any age group would not exceed 85 per cent

Further judgmental considerations were applied in cases where the trend line did not reflect more recent estimates for a particular age-sex group. The basis of these assumptions is discussed in paragraph 12 of the Appendix.

4. Once the projected participation rates were settled, they were applied to the population projections to give labour force projections.

5. Users interested in more detail on the methodology should refer to the Appendix.

Population projections

6. In November 1990, the ABS published population projections under the various sets of assumptions described below. Series A and D provide the maximum and minimum projected populations for Australia under

the alternative assumptions, while Series C provides the medium population growth scenario.

PROJECTION SERIES

Series	Assumptions
A	Mortality (H) Fertility I (H) Overseas migration I
C	Mortality (L) Fertility II (H) Overseas Migration I
D	Mortality (L) Fertility II (L) Overseas migration II

Note - (L): Low Level (H): High Level

7. For this publication the projected participation rates have been applied to the Series A and D population projections (Series A and C population projections are identical for the period up to 2005 for the age groups tabulated).

8. From these sets of population projections, adjustments were made to account for the number of defence force personnel, thus making the projections consistent with the population covered by the Labour Force Survey (i.e. civilian rather than total population). The assumption used in making this adjustment is that the proportion of the population in the defence forces (by age group as at January 1991) will remain constant throughout the projection period.

9. Assumptions relating to mortality, migration and fertility are embodied in the population projections, and any interpretation of the resulting labour force projections should take these into account.

10. More details on the assumptions which comprise these series and the population projections techniques can be found in Sections 2 and 4 of *Projections of the Populations of Australia, States and Territories 1989 to 2031* (3222.0).

GLOSSARY

Employed: Persons aged 15 and over who, during the reference week:

- (a) worked for one hour or more for pay, profit, commission or payment in kind in a job or business, or on a farm (comprising employees, employers and self-employed persons); or
- (b) worked for one hour or more without pay in a family business or on a farm (i.e. unpaid family helpers); or
- (c) were employees who had a job but were not at work and were: on paid leave; on leave without pay for less than four weeks up to the end of the reference week; stood down without pay because of bad weather or plant breakdown at their place of employment for less than four weeks up to the end of the reference week; on strike or locked out; on workers' compensation and expected to be returning to their job; or receiving wages or salary while undertaking full-time study; or
- (d) were employers, self-employed persons or unpaid family helpers who had a job, business or farm, but were not at work.

Labour force: For any group, persons who were employed or unemployed, as defined.

Participation rate: For any group, the labour force (i.e. the employed and the unemployed as defined) expressed as a proportion of the population in the same group.

Seasonally adjusted series: Seasonal adjustment is a means of removing the estimated effects of normal seasonal variation from the series so that the effects of

other influences on the series can be more clearly recognised. Seasonal adjustment does not remove the irregular or non-seasonal influences which may be present in any particular month.

Trend series: A smoothed seasonally adjusted series of estimates. Users may wish to refer to the ABS Information Papers *A Guide to Smoothing Time Series — Estimates of 'Trend'* (1316.0), and *Time Series Decomposition — An Overview* (1317.0) for more detailed information on producing trend estimates by smoothing seasonally adjusted time series data.

Unemployed: Persons aged 15 and over who were not employed during the reference week, and:

- (a) had actively looked for full-time or part-time work at any time in the four weeks up to the end of the reference week and:
 - (i) were available for work in the reference week, or would have been available except for temporary illness (i.e. lasting for less than four weeks to the end of the reference week); or
 - (ii) were waiting to start a new job within four weeks from the end of the reference week and would have started in the reference week if the job had been available then; or
- (b) were waiting to be called back to a full-time or part-time job from which they had been stood down without pay for less than four weeks up to the end of the reference week (including the whole of the reference week) for reasons other than bad weather or plant breakdown.

APPENDIX

LABOUR FORCE PROJECTIONS, AUSTRALIA: METHODOLOGY

Introduction

This appendix contains a detailed explanation of the methodology used to produce the labour force and participation rate projections in this publication. It describes the analysis of participation rates for the period 1978 to 1990, and the application of this study to produce projections for the period 1992 to 2005.

2. The methodology was developed by Michael Anderson, Assistant Director, Econometric and Time Series Analyses Section, ABS.

Background

3. In the past, the main methods used in Australia for projecting the labour force involved the extrapolation of participation rate trends taking into account "judgmental considerations" (based on economic theories about the supply of labour and on recent and expected developments in Australia and in comparable labour markets in other countries) where appropriate. These extrapolated participation rate projections were then applied to population projections to give labour force projections.

4. Econometric modelling has also occasionally been used for projections, as well as for analysis and explanation of labour market behaviour. It may be that labour force supply behaviour can be better understood and predicted by modelling techniques. The strategy suggested by this study does not argue against the eventual use of a more sophisticated framework when demonstrable advantages are to be gained. However, such modelling is at present a high cost option and as yet does not appear to be able to provide more reliable labour force projections than can be accomplished by extrapolation, augmented by judgmental considerations.

5. A critical review of efforts to model the Australian labour force was published by the Bureau of Labour Market Research (BLMR) in 1982 (Dunlop et al. 1982). It concluded that existing models had proved to be of little value for explanation, policy analysis or prediction, especially in the face of the major structural changes in the labour force through the 1970s. In each case, the predictive ability of the models was shown to be worse than would have been achieved by assuming no change in participation rates.

6. Examination of similar studies undertaken in the United States (Bureau of Labor Statistics), New Zealand (Department of Statistics) and the United Kingdom (Department of Employment) showed that:

- The approaches are based on relatively simple extrapolation or modelling methods. In the United

States and New Zealand, where modelling has been considered, it has been rejected as providing unsatisfactory results.

- Projections had to be made over a relatively short period (5 to 15 years).
- Judgment in applying assumptions plays a large part in the projections. In some cases, participation rates are projected to converge to an arbitrarily determined constant level.

7. These points are generally consistent with the Australian experience. Consequently, the labour force projections included in this publication are compiled from projected participation rates and their application to current ABS population projections.

Participation rates

8. Since February 1978, the Labour Force Survey has been conducted monthly. Prior to that, the survey was conducted quarterly although the definitions and scope were consistent.

9. For this publication, the monthly participation rates from 1978, by sex and age group, were selected for trend analyses, rather than the longer series for quarterly participation rates, because:

- many of the institutional developments feeding through to current and prospective changes in participation rates, especially for women, emerged in the 1970s. Hence, the extra data contained in the longer quarterly series may not necessarily be useful;
- the quarterly series are not an 'average over the quarter' measure, but are for the months of February, May, August and November. A problem which may be encountered in using monthly observations as a proxy for a quarterly series is that the trend level generated will depend on the months selected.

Methodology

10. Three methods for projecting participation rates used in previous labour force projections were considered in developing the methodology:

(1) *The constant participation rate.* In the simplest form of projection, the current participation rate can be assumed constant throughout the projection period. However, given the significant trends of the past 20 years, this approach would be difficult to justify. More appropriately, a constant participation rate can be used as an end point at which the trend is assumed to stabilise, as generally adopted by previous labour force projections.

This prevents the projected trend straying to what might be considered unrealistic levels. Alternatively, the constant end point might be interpreted as the long run equilibrium level which participation rates are moving towards given current and expected structural and institutional developments.

(2) *Simple regression to estimate the direction of the participation rate trend.* The most reasonable application of this method is direct extrapolation into the early part of the projection period or as a guideline to be evaluated in the context of other factors. The selection of appropriate start points for regressions is important, so care should be exercised in using this methodology. If, for example, linear trend extrapolation is used to project female participation rates, different projections would be obtained if the start point was from 1978 to those which would be obtained if the start point was from 1983.

(3) *Limit the participation rate at the end of the projection period and interpolate a trend from the present.* This can be done with input from overseas data by looking at economies which have experienced structural changes similar to those now occurring in Australia. In any case, the proximity of trend extrapolations to numerical limits such as zero or 100 per cent may require the setting of a limit. Similarly, the cross sectional relationship of age-sex groups may dictate the limiting of a trend. For example, while it is reasonable to expect a continuing reduction of the difference between female and male participation rates, it seems less likely that female rates in general would significantly exceed male rates during the period covered by the projections.

11. In practice, the methodology to produce the projections included in this publication has involved some amalgamation of all three methods, thus utilising the broadest range of available information. The analyses were undertaken on actual data to August 1990.

12. One contributing factor to participation rate levels (observed from past trends) is the level of economic activity. These projections assume that for the span of the projection period, Australia will be experiencing economic growth, which on average will be similar to that experienced in the 10 years to August 1990. Participation rate ceilings were also set assuming :

- participation rates for females would not exceed those for males for any age group; and
- the projected female participation rate for any age group would not exceed 85 per cent, a level comparable with that currently existing in Sweden, and other Scandinavian countries for prime working age groups. This rate is higher than that existing in other OECD countries but comparable to the more recent labour force projections for the USA, prepared by the Bureau of Labor Statistics.

First stage: simple regressions

13. Given these assumptions, the first stage in the method used for the preliminary projections was to project participation rates by applying simple regressions against time to identify trend, that is, method two as described above. (Smoothed seasonally adjusted estimates of labour

force participation rates were chosen for the extrapolations rather than the original or seasonally adjusted participation rate series as they provide a better indicator of the underlying direction when series have a noticeable seasonal pattern and/or are highly irregular). For these age specific labour force data, rates for the younger age groups were highly seasonal whilst those for the older age groups were highly irregular.

14. Ordinary least squares regression was applied to derive a linear trend line for each age-sex group. Each group was then assessed individually according to the criteria discussed above.

Second stage: assessment of results

15. A second stage to this method was to undertake a cross-sectional analysis ensuring the selected participation rates were meaningful. This involved generating two sets of graphs. The first set was the male to female ratio for each age group (males 15-19 / females 15-19 etc). The second set showed graphs of the ratio of the current age group to the previous age group by sex i.e. the ratios of males 65-99 / males 60-64, females 65-99 / females 60-64 etc. If this second stage revealed inconsistent results, a judgmental result was proposed using methods one or three as described above, and the analysis repeated.

16. A problem with method three is the selection of an appropriate function to approach the selected end point. Method three was used to project the rates for females aged 20-24, 25-34 and 35-44 years. A quadratic function was used to smooth the projected rates from the 1990 linear regression value to the 2005 ceiling, incorporating the slope of the linear regression (see paragraph 29 for more details).

17. The graphs shown on pages 21 to 23 relate to the first stage of the methodology outlined in paragraphs 13 and 14. Graphs were produced for rates by sex by age group from 1978 to 2005. They show the smoothed seasonally adjusted series from February 1978 to August 1990, and projections of these series to 2005. Note that for many age groups the graph is not continuous; there is a gap between the actual August 1990 value and the predicted September 1990 value. This gap occurs as the predictions from a regression result are an approximation to the underlying long run trend and the actual participation rate at any point can deviate from this long run trend.

18. Projections of the labour force were next obtained by applying the projected "June" participation rate for each year, 1992 to 2005, to the corresponding population projections. However, before this could be done, it was necessary to make adjustments to the population projections for the number of defence force personnel, making the projections consistent with the population covered by the Labour Force Survey (i.e. civilian rather than total population). The assumption used in making this adjustment is that the proportion of the population in the defence forces (by age group as at January 1991) expressed as a percentage will remain unchanged throughout the projection period.

Limitations of the methodology

19. There are limitations of the trend analyses method which should be kept in mind. First, there is no rigorous and coherent theoretical background to the method. Projections of trend only provide a scenario which may be realised if the necessarily arbitrary assumptions about participation rates eventuate.

20. Second, the division of approaches into econometric modelling and trend analyses is not necessarily clear cut. An appreciation of theories and issues in labour market behaviour could certainly be brought to bear in the qualitative judgments to be used in modifying trend projections of participation rates. Detailed studies of particular age/sex groups can be used, for example, the BLMR use of modelling results for projecting the participation rate of males aged 55 and over. Thus, it is conceivable to incorporate some features of a modelling approach either by using econometric methods to project participation for suitable groups, or by applying a specified theory in the "judgment" to be exercised.

21. Assumptions relating to mortality, migration and fertility are embodied in the population projections, and hence any interpretation of the labour force projections should take these into account (see pages 4-5 and 17-36 of *Projections of the Populations of Australia, States and Territories 1989 to 2031* (3222.0)).

Male participation rates - summary

22. Based on overseas and Australian experience as well as the cross-sectional analysis described in paragraph 15, the regression based results were accepted as the best estimate for the 20-24, 25-34, 35-44, 45-54 and 55-59 year age groups, where the outcome was a continuation of the trend decline in participation rates.

23. For the 15-19, 60-64 and the 65 and over age groups, the regression based results were rejected and replaced by judgmental considerations as outlined below.

24. Regression results for the 15-19 year age group were considered inappropriate because they produced projected figures which were below the female participation rate. Projections for male participation rates for this age group were calculated by multiplying the projected female participation rates (which were determined using the regression analysis) for the same age group by the average value of the male to female ratio between August 1986 and August 1990.

25. The largest single influence on regression results for the 60-64 year age group is the war service pension. The trend regression result was considered unsuitable and after examining cross-sectional graphs it was decided that the participation rate should be fixed at a constant 50 per cent for the projection period.

26. For males aged 65 and over, the regression results showed a continuing decline in the participation rates.

However, the graph of actual estimates indicated a levelling off during later years and it was decided in this case to override the decline in the trend. The projections were held constant at the average participation rate for males aged 65 and over for the August 1986–August 1990 period.

Female participation rates - summary

27. The regression results were varied or replaced on the basis of judgmental considerations for all age groups except the 15-19 and 45-54 year age groups.

28. For 15-19 year old females, as with males, the determining factor of this age group's participation rate is education retention levels. The participation of females in secondary education has been increasing over time and consequently, the regression result was considered appropriate.

29. The 20-24, 25-34 and 35-44 year age groups can be considered together. The regression based results gave a participation rate in 2005 of 91.3 per cent for the 20-24 year age group, 85.5 per cent for the 25-34 year age group and 88.7 per cent for the 35-44 year age group. These projected participation rates result in near equality between male and female participation rates by 2005 for the 25-34 and 35-44 year age groups, while for the 20-24 year age group, the projected female participation rate exceeds that of males. Whilst participation rates are expected to converge, it has been assumed (based on overseas and Australian experience) that the female participation rate would not exceed that of males for the same age group over the projection period. Participation rate projections for the 25-34 and 35-44 year age groups also appear a little high compared to the traditional ratios revealed by cross-sectional analysis graphs. Therefore, based on overseas experience and trends, a ceiling of 85 per cent for all three age groups was set. The limit in 2005 would be approached gradually, according to a quadratic function.

30. The regression result for the 45-54 year age group projected a participation rate of 76.3 per cent by 2005. This end point was a result based on the straight line function from the regression. As it is reasonable to expect that the participation rate would not fall below the end point value, the regression result was considered appropriate.

31. For the 55-59 year age group, the regression result indicated that the participation rate for females will rise to 37.0 per cent by the year 2005. This level was considered likely to be too low, as it is reasonable to expect that as the current generation of younger women move into the older age groups their current higher level of labour force participation will be in part carried through to the older age groups.

32. In Australia, the average ratio between the 55-59 and 45-54 year age groups during the August 1986–August 1990 period has been slightly above 0.56. This is consistent with overseas experience where the ratio has been around 0.6. Consequently, the projected ratio was kept constant at this rate, leading to the projected female participation rates for the 55-59 year age group rising to 42.3 per cent.

33. Following on from this, the average ratio between females aged 60-64 and 55-59 was calculated for the period August 1986 and August 1990. This ratio was then held constant for the projection period, resulting in a projected participation rate in 2005 of 18.4 per cent for the 60-64 year age group.

34. For females aged 65 and over, the regression results showed a decline in trend. This was considered to be unrealistic as the decline in trend has not been maintained in recent years. It was therefore decided to hold the projections constant at the average participation rate for females aged 65 and over for the August 1986–August 1990 period.

Related publications and references

ABS publications:

The Labour Force, Australia (6203.0)

Projections of the Populations of Australia, States and Territories 1989 to 2031 (3222.0)

Information Paper: A Guide to Smoothing Time Series — Estimates of 'Trend' (1316.0)

Information Paper: Time Series Decomposition — An Overview (1317.0)

Other references/papers:

Anderson, M. & Ross, B. (1987), 'Labour Force Projections and Tables of Working Life: A Preliminary Investigation', *Paper to the 16th Conference of Economists*, August.

Commonwealth Treasury (1970), *Supplement to the Treasury Information Bulletin: Projections of the Labour Force 1968–81*, Government Printer of the Commonwealth of Australia, Canberra.

Dunlop, Y., Healy, T. & McMahon, P. (1982), *Australian Models of Labour Force Participation: A Critical Review*, Working Paper No. 2, Bureau of Labour Market Research, Canberra.

New Zealand Department of Statistics (1974), *New Zealand Labour Force Projections 1971–2001*.

OECD (1988), *Labour Force Statistics*. OECD, Paris, France.

Sams, D. & Williams, P. (1982), *Some Projections of the Australian Population and Labour Force, 1980 to 2001*, Preliminary Working Paper BP-380 IMPACT Project, Melbourne.

United States Department of Labor, Bureau of Labor Statistics (1986), *Employment Projections for 1995: Data and Methods*, Bulletin 2253, United States Government Printing Office, Washington, D.C.

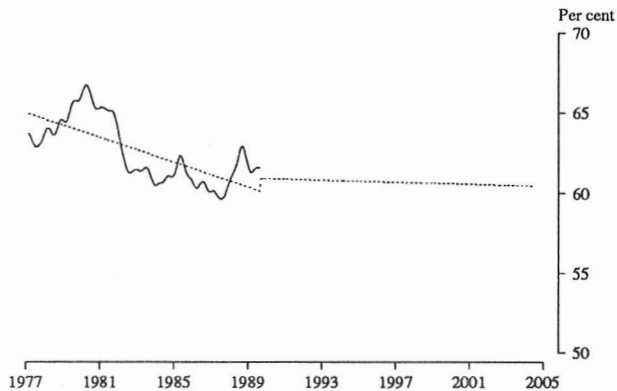
PARTICIPATION RATES BY AGE AND SEX, SMOOTHED SEASONALLY ADJUSTED AND PROJECTED, 1978 - 2005

The following graphs depict smoothed seasonally adjusted participation rates for each age-sex group and the linear regression values for the period February 1978 to August 1990, together with the monthly projected values up to June 2005. Care should be taken in comparing participation rates for different age groups, as data have been graphed using different scales.

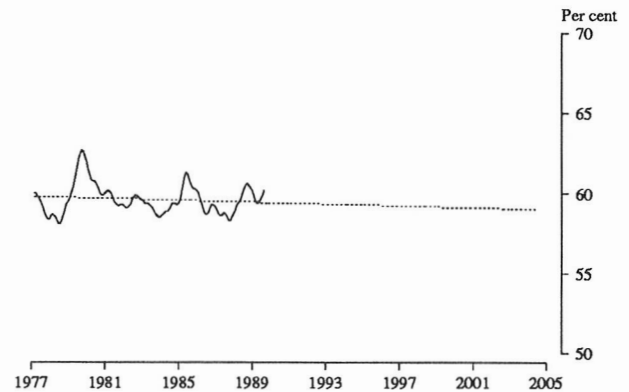
Legend:

———— Smoothed seasonally adjusted estimates
 Linear regression and projected values

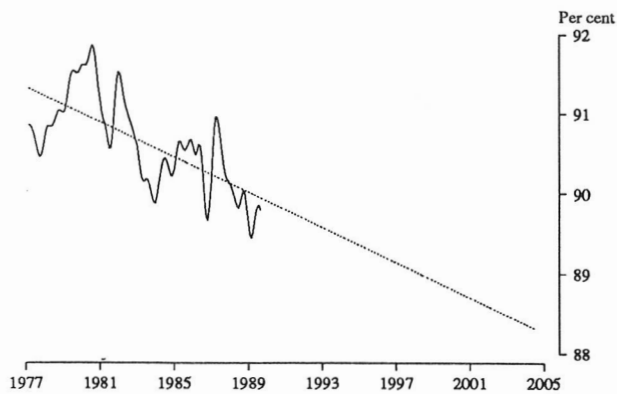
MALES 15-19 YEARS



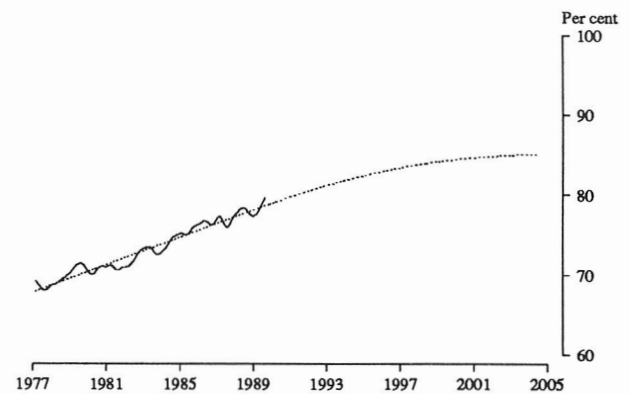
FEMALES 15-19 YEARS



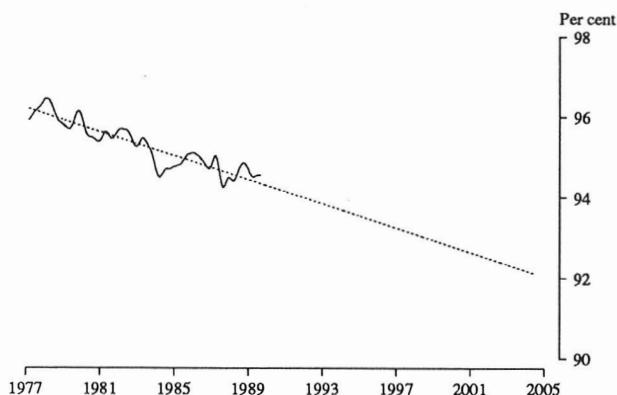
MALES 20-24 YEARS



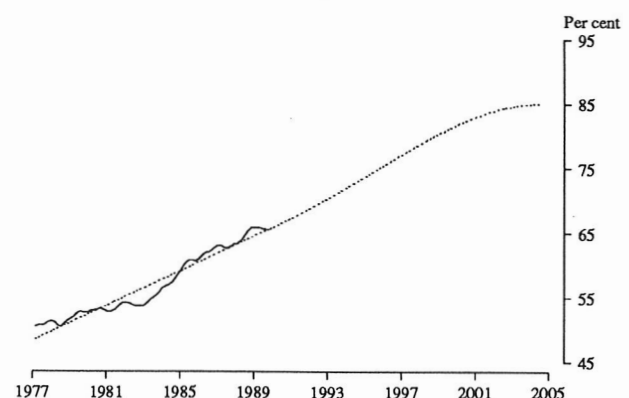
FEMALES 20-24 YEARS



MALES 25-34 YEARS



FEMALES 25-34 YEARS

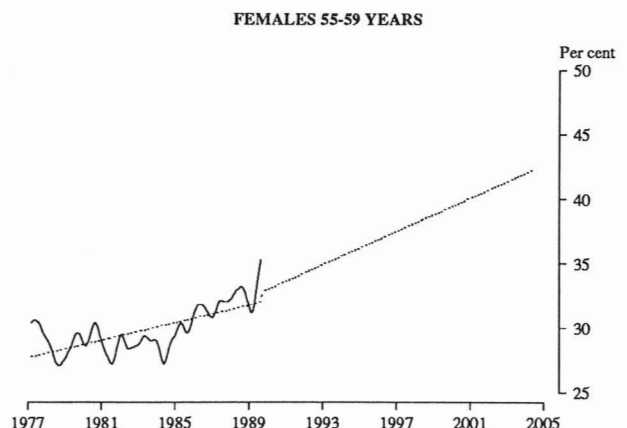
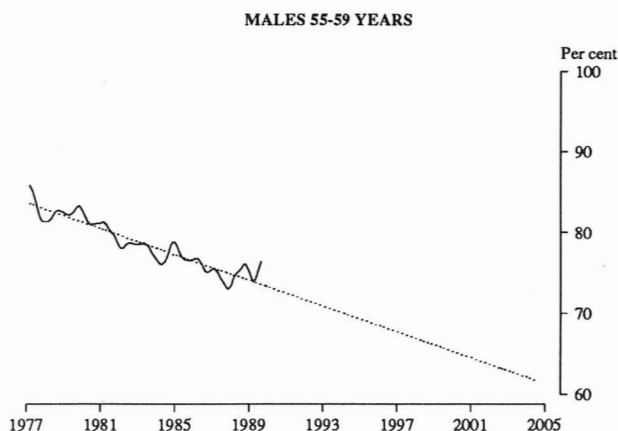
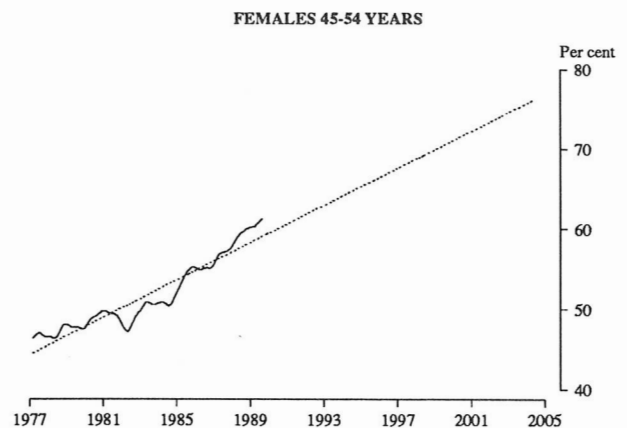
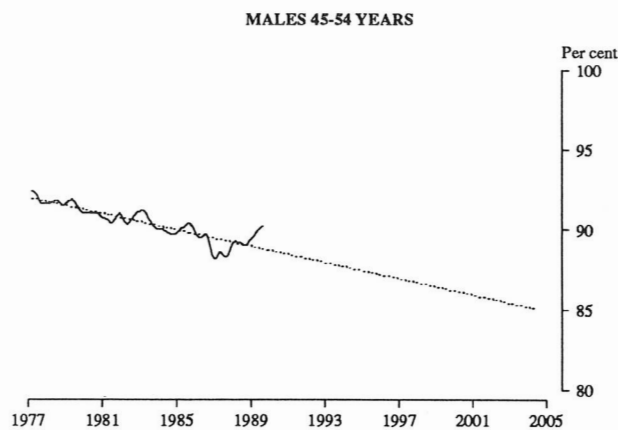
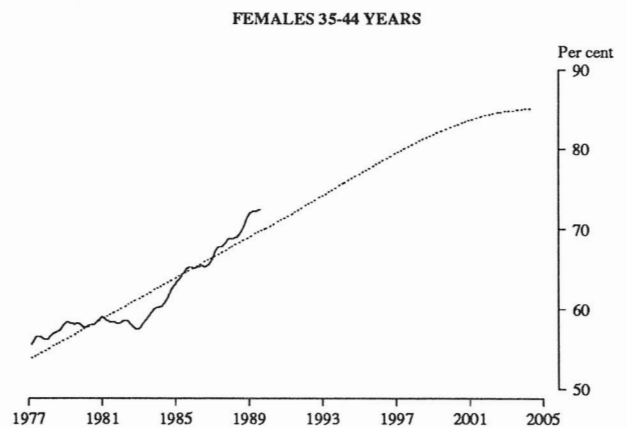
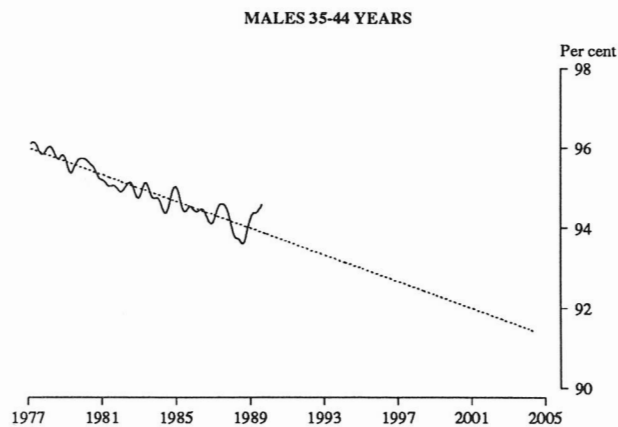


PARTICIPATION RATES BY AGE AND SEX, SMOOTHED SEASONALLY ADJUSTED AND PROJECTED, 1978 - 2005

The following graphs depict smoothed seasonally adjusted participation rates for each age-sex group and the linear regression values for the period February 1978 to August 1990, together with the monthly projected values up to June 2005. Care should be taken in comparing participation rates for different age groups, as data have been graphed using different scales.

Legend:

———— Smoothed seasonally adjusted estimates
 Linear regression and projected values



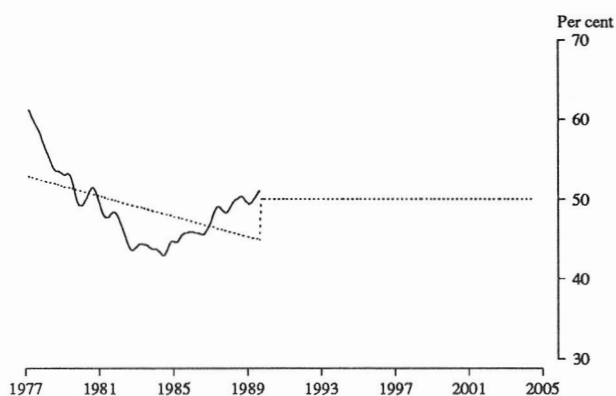
PARTICIPATION RATES BY AGE AND SEX, SMOOTHED SEASONALLY ADJUSTED AND PROJECTED, 1978 - 2005

The following graphs depict smoothed seasonally adjusted participation rates for each age-sex group and the linear regression values for the period February 1978 to August 1990, together with the monthly projected values up to June 2005. Care should be taken in comparing participation rates for different age groups, as data have been graphed using different scales.

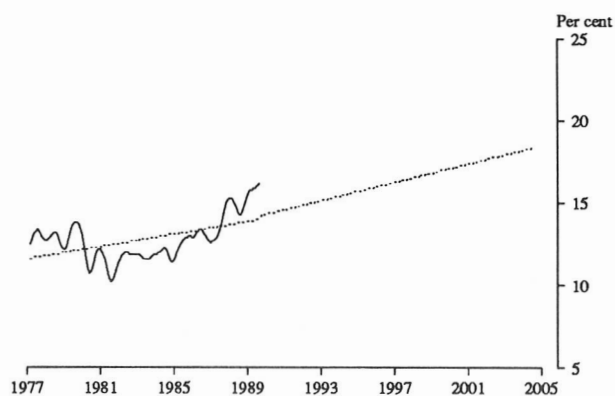
Legend:

- Smoothed seasonally adjusted estimates
 Linear regression and projected values

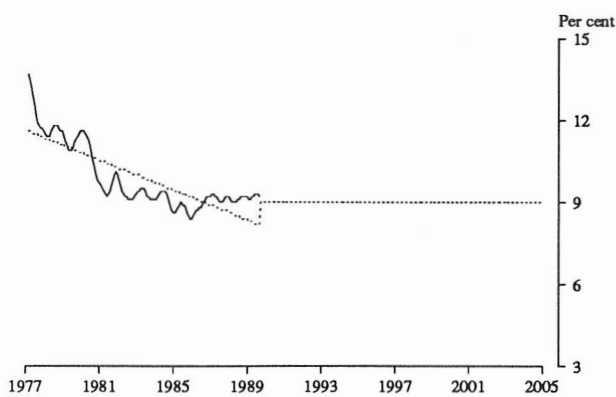
MALES 60-64 YEARS



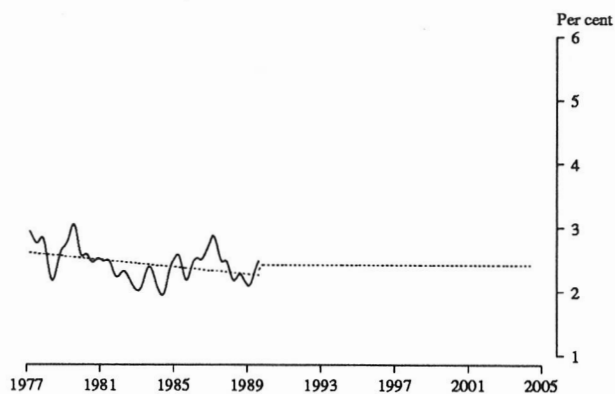
FEMALES 60-64 YEARS



MALES 65 YEARS AND OVER



FEMALES 65 YEARS AND OVER



LABOUR FORCE SPECIAL DATA SERVICES...

UNPUBLISHED DATA

- **Contact** Don Clark (06) 252 6525

Much more information about the labour force can be made available, subject to statistical reliability. Time series tailor-made tables are available on paper or on floppy disk (cost depends on table complexity). Data items available include:

Employed persons
Unemployed persons
Persons not in the labour force
Participation rate
Marital Status

Country of birth
Duration of Unemployment
Sex
Age
State/Territory
Status of worker

Full time/part time status
Industry
Occupation
and more...

You can also get ABS monthly labour force survey data in these ways:

DISCOVERY

- **Contact** Jackie McGee (06) 252 6831
Available via Telecom's videotext system, key *656#
Instantly updated on the day of release
Selected main statistics available

AUSSTATS

- **Contact** Peter Davidson (06) 252 6017
On-line data access to time series

TELESTATS

- **Contact** Mark Gore (06) 252 5405
Download tables from publications like 6202.0 on the day of release via Telecom's KEYLINK service

FLOPPY DISKS

- **Contact** Terry Turner (06) 252 6684
Selected time series data in standard or tailored formats; OR
The Labour Force, Australia, Preliminary (6271.0): time series from the bulletin 6202.0 in standard format

MICROFICHE

- **Contact** Don Clark (06) 252 6525
A wide range of tables is available



For more information ...

The ABS publishes a wide range of information on Australia's economic and social conditions. A catalogue of publications and products is available from any of our Offices (see below for contact details).

Information Consultancy Service

Special tables or in-depth data investigations are provided by the ABS Information Consultancy Service in each of our Offices (see below for contact details).

Electronic Data Services

A growing range of our data are available on electronic media. Selections of the most frequently requested data are available, updated daily, on DISCOVERY (Key *656#). Our TELESTATS service delivers major economic indicator publications ready to download into your computer on the day of release. Our PC-AUSSTATS service enables on-line access to a data base of thousands of up-to-date time series. Selected datasets are also available on diskette or CD-ROM. For more details on our electronic data services, contact Information Services in any of our Offices on the numbers below.

Bookshops and Subscriptions

There are over 500 titles available from the ABS Bookshops in each of our Offices. You can also receive any of our publications on a regular basis. Join our subscription mailing service and have your publications mailed to you in Australia at no additional cost. Telephone our Publications Subscription Service toll free on 008 02 06 08 Australia wide.

Sales and Inquiries



SYDNEY (02) 268 4611
MELBOURNE (03) 615 7000
BRISBANE (07) 222 6351
PERTH (09) 323 5140

ADELAIDE (08) 237 7100
HOBART (002) 20 5800
DARWIN (089) 81 3456
CANBERRA (06) 252 6627



Information Services, ABS, PO Box 10, Belconnen ACT 2616
or any ABS State office.



2062600012058

ISBN 0 642 16033 3